

Plantae Chinenses Forrestianae.

Plants discovered and collected by George Forrest during his first exploration of Yunnan and Eastern Tibet in the years 1904, 1905, and 1906, and during his second exploration in the year 1910.

Enumeration and Description of Species of *Saxifraga* and *Bergenia*.

BY

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With Plates LXXXVII-CII.

SAXIFRAGA, Tourn.

SECT. NEPHROPHYLLUM, Gaud.

Fl. helv. iii, p. 85.

Saxifraga sibirica, L. Syst. x, p. 1027; Engl. Monogr. Saxifr. p. 101; Hooker f. Fl. Brit. Ind. ii, p. 390.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 13,000 ft. Alpine pasture. (Plant of 1½-2½ inches. Flowers white.)" G. Forrest. No. 6191. July 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-12,000 ft. Moist, shady rocks in side valleys. (Plant of 3-4 inches. Flowers white.)" G. Forrest. No. 4690.

SECT. DACTYLOIDES, Tausch.

Hort. Canal. fasc. i, pr. p.

Saxifraga humilis, Engl. et Frmscher. Sp. nov. Plate lxxxvii.

Densissime caespitosa, caudiculis epigaeis circ. 1 cm. longis dense rosulatum foliatis unifloris. Folia lineari-vel oblongo-lanceolata, 8-10 mm. longa, 2-3 mm. lata, margine pilis pluricellularibus uniserialibus laxè obsita, inferne hyalina, subtus nervis semipellucidis. Pedicelli brevissimi 3-5 mm. longi,
[Notes, R.B.G., Edin., No. XXIV., January 1912.]

pilosi; sepala suberecta ovata, 2 mm. longa, 1.5 mm. lata, margine pilis longis uniserialibus glanduliferis laxè obsita, trinervia, nervis sub apice in verruculam majusculam oblongam confluentibus; petala obovata, haud unguiculata, 4 mm. longa, 2.5 mm. lata, trinervia, alba; stamina sepalis fere aequilonga; ovarium inferum subglobosum stilis erectis 1.5 mm. longis stigmatè maiusculo instructis. Capsula . . .

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 35' N. Alt. 15,000 ft. Moist situations amongst rocks. (Matted plant of 1 inch. Flowers white.)" G. Forrest. No. 6088. June 1910.

SECT. BORAPHILA, Engl.

Ind. crit. p. 9.

Saxifraga strigosa, Wall. Cat. No. 448.

"Yunnan, descent from pass between Teng Chuan and Sung Kwei valleys. Alt. 10,000 ft. Moist, rocky situations." G. Forrest. No. 171. September 1904.

"Near Sung Kusi. Alt. 12,000 ft." G. Forrest. No. 1139. November 1904.

"N.W. Yunnan, eastern flank of the Lichiang range. Lat. 27° 20' N. Alt. 10-11,500 ft. Shady, moist situations in pine forests. (Plant of 6-10 inches. Petals white, basal portion spotted reddish-orange, anthers reddish-orange.)" G. Forrest. No. 2921. September 1906.

"Lat. 27° 30' N. Alt. 9500-11,000 ft. Dry, open situations amongst pine scrub. (Plant of 2-6 inches, upper half of petals white, lower half spotted orange.)" G. Forrest. No. 6340. August 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-12,000 ft. Dry exposed situations on the margins of pine forests. (Plant of 3-6 inches. Petals yellowish-white, base of interior marked deep orange-red, anthers red.)" G. Forrest. No. 5061. September 1906.

"Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 9-10,000 ft. Dry, stony banks on the margin of pine forests. (Plant of 4-10 inches. Flowers creamy-yellow, spotted crimson-maroon at base.)" G. Forrest. No. 6872. 1910.

Saxifraga clavistaminea, Engl. et Frmscher. Sp. nov. Plate lxxxviii.

Caudiculi epigaei erecti 1-4 cm. longi, plerumque inaequaliter foliati, foliis basi atque superne rosulatis confertis, medio saepe

aphylli, pluri (3-8)-flori, raro uniflora, longe pubescentes. Stolones ex foliorum axillis orientes ascendentes 3-6 cm. longi apice gemmulam foliorum minorum gerentes. Folia tenera, oblongo-ovata vel late spatulata, in petiolum brevem marginatum angustata, grosse saepe dupliciter crenato-dentata, dentibus subacutis aequalibus, subtus glabra, supra pilis brevibus multicellularibus pluriserialibus densiuscule obsita, basalia rosulatum conferta 1.5-2 cm. longa, 0.8-1 cm. lata, media (si adsunt) minora, superiora etiam conferta quam basalia maiora 2.5-3.5 cm. longa, 1.5-2 cm. lata. Inflorescentiae rami 4-7 cm. longi laxae pubescentes, 1-2-flori, unibracteati; pedicelli quam flores 2-3-plo longiores glabri; sepala in anthesi reflexa oblongo-ovata 2-2.5 mm. longa, 1-1.3 mm. lata, glaberrima, trinervia, nervis sub apice in verruculam confluentibus; petala ovata in unguem angustata 4.5 mm. longa, 2 mm. lata, trinervia, nervis lateralibus supra trientem inferiorem nervi medii abeuntibus, ad basim lutea, dimidio inferiore violaceo-maculata; stamina pistillum fere aequantia, filamentis clavatis, antheris atro-violaceis; ovarium ovoideum annulo mellifero crassiusculo, sensim in stilos breves stigmatibus minuto instructos attenuatum carpellis usque ad annulum separatis. Capsula . . .

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-11,000 ft. Open, stony pastures. (Plant of 2-5 inches. Flowers white.)" G. Forrest. No. 6794. 1910.

Saxifraga micrantha, Edgew. Trans. Linn. Soc. xx, 1846, p. 50.

1. *Micrantha typica*.

(a) f. *corymbiflora*, Engl. et Frmscher.

Caules floriferi multiflora, inflorescentia ramosissima corymbosa, ramis lateralibus longiusculis.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 11-12,000 ft. Crevices and ledges of moist, shady limestone cliffs. (Plant of 3-4 inches. Flowers white.)" G. Forrest. No. 6253. July 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 11-12,000 ft. Grassy openings in pine forests. (Plant of 4-8 inches. Flowers white, anthers brick-red.)" G. Forrest. No. 4204. September 1906.

(b) f. *minor*, Engl. et Frmscher.

Tenerrima, caules 7-14 cm. longi, pauci (2-4)-flori. Folia basalia late ovata obtusa, 10-13 mm. longa, 7-10 mm. lata.

"Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-11,000 ft. Dry, open, rocky situations. (Plant of 2-6 inches.

Petals white, anthers red, filaments petaloid.)" G. Forrest. No. 4198. September 1906.

(c) f. **foliosa**, Engl. et Frmscher.

Caules 4-25 cm. longi, pluri (2-8)-flori, fere medio uno folio ovato vel cordato-ovato 0.7-3 cm. longo, 0.4-1.5 mm. lato instructi; folia basalia ut typica.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-11,000 ft. Moist, shady ledges on cliffs in side valleys. (Plant of 2-4 inches. Flowers white, anthers red.)" G. Forrest. No. 4203. July 1906.

"Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 12-13,000 ft. Barren alpine pasture. (Plant of 2-5 inches. Flowers white.)" G. Forrest. Nos. 6972, 7072. 1910.

2. var. **yunnanensis**, Franch.

"S.E. Tibet, on the Yangtze-Mekong divide. Lat. 28° N. Alt. 14-15,000 ft. In pine forests near the summit of the Kari. (Flowers white.)" G. Forrest. No. 99. September 1904.

S. micranthoides, Engl. Sp. nov. Plate lxxxix.

Caules 10-15 cm. longi, pluri (3-10)-flori; foliis caulinis destituti, modo ad inflorescentiae ramorum basim bracteati, tota longitudine ut pedunculi pilis pluricellularibus uniserialibus obsiti. Folia basalia oblongo-ovata vel elliptica, obtusa, aequaliter crenata vel crenato-dentata, non cordata, sed in petiolum laminae plerumque aequilongum raro longiorem sensim angustata; lamina 1.5-2 cm. longa, 0.7-1 cm. lata, supra pilis brevibus multicellularibus pluriserialibus densiuscule obsita; bractae lanceolatae sessiles, saepe serratae, 5-10 mm. longae, 2-4 mm. latae. Pedicelli floribus multo longiores, ut caules pilosi; sepala in anthesi reflexa, ovata, 2-2.5 mm. longa, 1-1.5 mm. lata, glabra, trinervia, nervis sub apice in verruculam confluentibus; petala forma variabilia, plerumque late ovata in unguem brevem contracta, 3-4 mm. longa, 2-3 mm. lata, trinervia, alba, ad basin maculis duobus luteis instructa; stamina petalis fere aequilonga, filamentis late clavatis; ovarium ovoideum carpellis connatis in stilos breves crassiusculos stigmatibus parvo coronatis exeuntibus. Capsulae loculi oblongo-ovati; stili divaricati.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 15' N. Alt. 11,000 ft. Moist, shady situations on rocks and ledges of cliffs. (Plant of 3-5 inches. Flowers white, anthers brick-red, filaments petaloid.)" G. Forrest. No. 2516. July 1906.

"Lat. 27° 25' N. Alt. 11-12,000 ft. On humus-covered boulders and ledges of cliffs. (Plant of 2-5 inches. Flowers white.)" G. Forrest. No. 6206. July 1910.

Saxifraga atrata, Engl. Bull. Acad. Petersb. xxix (1883), p. 117.

"S.E. Tibet, on the Mekong-Salwen divide. Lat. 27° 28' N. Alt. 11-13,000 ft. Dry, open, stony limestone ridges. (Erect plant of 2-4 inches. Flowers yellowish-white.)" G. Forrest. No. 467. July-August 1903.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 12' N. Alt. 11-12,000 ft. Rocky, shady situations in pine forests. (Plant of 2-6 inches. Flowers white, base of petals marked rich lemon-yellow, anthers dark red.)" G. Forrest. No. 2928. September 1906.

"Lat. 27° 4' N. Alt. 13-14,000 ft. Stony, alpine pasture, and on cliffs. (Plant of 2-3 inches. Petals pale yellow, with a blotch of deeper colour at base, gynaecium dark green.)" G. Forrest. No. 6153. July 1910.

"Lat. 27° 20' N. Alt. 12,000 ft. Limestone drift and crevices of cliffs. (Plant of 3-4 inches. Petals white, with an orange blotch at base, gynaecium deep, ruddy green.)" G. Forrest. No. 6417. August 1910.

Saxifraga parvula, Engl. et Frmscher. Sp. nov. Plate xc.

Dense caespitosa, caudiculis brevibus rosulatis foliatis. Caules floriferi erecti 1.5-2 cm. longi, unibracteati, uniflori, tota longitudine atro-purpurei, pilis longis purpureis densiuscule obsiti. Folia basalia rosulatis conferta, subrotundo-obovata, in petiolum marginatum subaequilongum angustata, 9-11 mm. longa, 5-7 mm. lata, grosse crenata, subtus glabra, margine ac supra pilis longis multicellularibus pluriserialibus incoloratis laxè obsita. Pedicelli quam flores duplo longiores, dense longe violaceo-pilosi; flores in anthesi nutantes; sepala nec in anthesi nec in fructu reflexa, suberecta, petala paullum superantia, oblongo-ovata, 3.5-4.5 mm. longa, 2-3 mm. lata, superne margine sparse pilosa, trinervia, nervis anastomosibus conjunctis, sub apice in verruculam confluentibus, supra viridia, subtus dimidio inferiore vel omnino violacea; petala albida ovalia in unguem brevissimum angustata, 3.5 mm. longa, 2-2.5 mm. lata, trinervia, nervis lateralibus e medio nervi primarii orientibus, nervo primario apice clavato-dilatato; stamina pistillum fere aequantia, filamentis clavatis, antheris nigris; ovarium late ovoideum carpellis fere usque ad basim disjunctis, in stilos brevissimos stigmatibus majusculo coronatis exiens, inferne violaceum. Capsula loculis oblongo-ovatis divaricatis.

"Yunnan, eastern flank of the Lichiang Range. Lat. $27^{\circ} 40' N$. Alt. 15-16,000 ft. On limestone drift and moist, rocky soil. (Plant of $\frac{1}{2}$ -1 inch. Flowers white.)" G. Forrest. No. 6158. July 1910.

SECT. DIPTERA, Borkh.

Roem. Mag. i, p. 29.

Saxifraga cortusaefolia, Sieb. et Zucc. Akad. Münch. iv, ii (1843), p. 190.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. $27^{\circ} 20' N$. Alt. 10-11,000 ft. On moss-covered rocks and banks in shady pine and mixed forests. (Plant of 6-15 inches. Flowers white, anthers brick-red.)" G. Forrest. No. 2401. June 1906.

"Lat. $27^{\circ} 40' N$. Alt. 10-12,000 ft. Shady situations in and on the margins of mixed and pine forests. (Plant of 1-2 ft. Flowers white.)" G. Forrest. No. 6067. July 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. $25^{\circ} 40' N$. Alt. 11-12,000 ft. Moist, shady, rocky situations in pine and mixed forests. (Plant of 9-14 inches. Flowers white, anthers brick-red.)" G. Forrest. Nos. 4199, 5059. August 1906.

"Eastern flank of the Tali Range. Lat. $25^{\circ} 40' N$. Alt. 10-11,000 ft. Shady banks in mixed forests. (Plant of 8-16 inches. Flowers creamy-white.)" G. Forrest. No. 6952. 1910.

SECT. HIRCULUS, Tausch.

Hort. Canal. i.

Conspectus gregum.

(A) Caules ad basim atque ad foliorum axillas pilis rufescentibus crispulis instructi.

(a) Caules aequaliter foliati; folia inferiora quam media non maiora, basalia deficientia.

(a) Folia oblongo-lanceolata vel oblongo-elliptica.

- (i) Folia haud ultra 1.5 cm. longa. § *Densae*.
- (ii) Folia circ. 3-4 cm. longa. § *Turfosae*.
- (β) Folia cordato-ovata. § *Stellariifoliae*.
- (b) Caules inaequaliter foliati; folia caulina a basiusque ad apicem sensim magnitudine decrescentia, basalia nunquam deficientia.
 - (a) Petala ovata vel obovata, vix § *Hirculoideae*.
triplo longiora quam lata.
 - (β) Petala lineati-oblonga, triplo vel § *Lychnitideae*.
magis longiora quam lata.
- (B) Petioli foliorum basium pilis rufescentibus parsissime instructi, inflorescentia pseudoracemosa, secunda floribus nutantibus. § *Nutantes*.
- (C) Caules pilis rufescentibus crispulis destituti.
 - (a) Folia margine hyalino apicali haud instructa.
 - (a) Caules aequaliter foliati, gemmis § *Gemmiparae*.
instructi.
 - (β) Caules inaequaliter foliati, foliis basalibus rosulatis confertis.
 - (i) Flagella deficientia.
 - (1) Folia maiora, margine § *Cinerascetes*.
cartilagineo spinuloso instructa.
 - (2) Folia plerumque parva, § *Sediformes*.
margine cartilagineo spinuloso haud instructa.
 - (ii) Flagella e rosula orientia. § *Flagellares*.
 - (b) Plantae parvae pulvinatae; folia § *Hemisphaericae*.
antice margine hyalina fimbriata.

SUB-SECT. DENSAE.

Caules ad basim atque ad foliorum axillas pilis rufescentibus crispulis instructi, aequaliter foliati aut foliis inferioribus quam media minoribus. Folia basalia deficientia; caulina ovata vel oblongo-lanceolata, plerumque 6-10 mm., haud ultra 1.5 cm. longa.

Saxifraga Bulleyana, Engl. et Frmscher. Sp. nov. Plate xci.

Caudiculi hypogaei gemmiferi, caespitem densum formantes. Caules erecti, 1.5 dm. longi, densiuscule aequaliter foliati, uni-vel biflori, inferne rufescentes et parce, ad axillas foliorum dense longe fusco-pilosi, superne pilis pallidis pubescentes. Folia caulina conformia oblongo-ovata in petiolum brevem angustata, 0.8-1 cm. longa, 0.4-0.6 mm. lata, utrinque atque margine pilis brevissimis glanduligeris sparse obsita, inferiora quam media minora. Pedicelli breves floribus fere aequilongi, pilis longis glanduliferis non coloratis pubescentes; sepala in anthesi non reflexa, ovata acuta circ. 4 mm. longa, 2 mm. lata, subtus et margine dense nigro-glandulosa, tri-(raro quinque-) nervia, nervis sub apice plerumque in verruculam confluentibus, nervis lateralibus saepe bifidis; petala late ovata vel ovalia in unguem brevem abrupte contracta 6-7 mm. longa, 4-6 mm. lata, trinervia, nervis lateralibus bi-vel trifidis, ad basim juxta nervos laterales bicallosa, lutea; stamina pistillum primum paulum superantia; ovarium ovoideum in stilos crassiusculos ovarii fere dimidium aequantes primum erectos stigmatibus majusculo instructos exiens. Capsula . . .

"N.W. Yunnan, western flank of the Lichiang Range. Lat. 27° 20' N. Alt. 12-13,000 ft. Moist, stony alpine pasture. (Tufted plant of 5-6 inches. Flowers golden-yellow.)" G. Forrest. No. 6341 August 1910.

Saxifraga petrophila, Franch. Pl. Delav. (1890), p. 237, var. **litschiangensis**, Engl. et Frmscher. Var. nov. Plate xcii.

Maior quam typus, caulibus 1.2-1.4 dm. longis, inferne longe fusco-pilosis, superne dense glanduloso-nigro-pilosis, pluri-(4-6)-floris. Folia caulina subacuta, 5-7 mm. longa, 3-4 mm. lata, omnia lamina laxa, margine dense pilis nigris brevibus obsita.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 35' N. Alt. 12,000 ft. Stony mountain meadows. (Plant of 3-6 inches. Flowers orange-yellow.)" G. Forrest. No. 6715. September 1910.

Saxifraga brachyphylla, Franch. Pl. Delav. (1890), p. 237.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 12' N. Alt. 9-10,000 ft. Boggy situations. (Plant of 8-14 inches. Flowers orange-yellow.)" G. Forrest. No. 124. September 1904.

Saxifraga macrostigma (Franch. Pl. Delav. (1890), p. 240),
emend. Engl. et Frmscher.

Conspectus varietatum et subvarietatum.

- (A) Folia glabra, caules semper uniflori, petala ecallosa.
 - (1) *macrostigma typica* (Franch. *l.c.*).
 - (2) var. *gracillima*, Engl. et Frmscher.
- (B) Folia glanduloso-pilosa, petala plerumque callosa.
 - (a) Caules uniflori.
 - (3) var. *Georgeana*, Engl. et Frmscher.
fa. *longipila*, Engl. et Frmscher.
 - (4) var. *aurantiascens*, Engl. et Frmscher.
 - (b) Caules pluriflori.
 - (5) var. *hypericoides* (Franch. pro specie), Engl. et Frmscher.
fa. *latifolia*, Engl. et Frmscher.
 - (a) subvar. *macrantha*, Engl. et Frmscher.
 - (b) subvar. *longistyla* (Franch. pro specie),
Engl. et Frmscher. In collectione Forrestiana deest.

(1) *macrostigma typica* (Franch., *l.c.*).

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 13-14,000 ft. Stony alpine pasture. (Tufted plant of 2-4 inches. Flowers yellow.)" G. Forrest. No. 6592. September 1910.

"Lat. 27° 30' N. Alt. 12-13,000 ft. Moist, stony alpine pasture. (Tufted plant of 3-6 inches. Flowers orange.)" G. Forrest. No. 6441 pr. p. August 1910.

"Lat. 27° 30' N. Alt. 14-15,000 ft. Stony, moist pasture." G. Forrest. No. 6221 pr. p. July 1910.

"Lat. 27° 35' N. Alt. 14,000 ft. Stony alpine pasture." G. Forrest. No. 6636 pr. p. September 1910.

(2) var. *gracillima*, Engl. et Frmscher. Var. nov.

Omnibus partibus minor quam typus. Caules 3-4 cm. longi densiuscule foliati. Folia saepe latiora, 5-6 mm. longa, 1-2 mm. lata.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 25' N. Alt. 11-12,000 ft. Ledges and crevices of limestone cliffs. (Tufted plant of 1-2½ inches. Flowers of orange-yellow, stamens orange.)" G. Forrest. No. 2904. September 1906.

"Lat. 27° 30' N. Alt. 12,000 ft. Limy pasture. (Plant of 1-2½ inches. Flowers deep orange.)" G. Forrest. No. 6137. July 1910.

"Lat. 27° 30' N. Alt. 12-13,000 ft. Moist, stony alpine pasture." G. Forrest. No. 6441 pr. p. August 1910.

(3) var. **Georgeana**, Engl. et Frmscher. Var. nov.

Dense caespitosa. Caules conferte foliati inferne rufescentes, ad foliorum axillas laxae longe fusco-pilosi. Folia caulina *linearilanceolata* margine pilis brevibus glanduliferis laxae obsita. Pedicelli breviter glanduloso-pilosi, petala ovalia quam sepala circ. 1-1.5 longiora, 3.5-4 mm. longa, 1.5-2.5 mm. lata, ad basim juxta nervos laterales callosa.

"N.W. Yunnan, near the summit of the Kari pass between Pung-tzu-la and Shi-zu. Lat. 28° N. Alt. 15,000 ft. Heathy grassland." G. Forrest. No. 88. September 1904.

fa. **longipila**, Engl. et Frmscher.

Differt foliis margine longe fusco-pilosis, pedicellis gilvotomentosis.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 14-15,000 ft. Stony, moist pasture." G. Forrest. No. 6221 pr. p. July 1910.

(4) var. **aurantiascens**, Engl. et Frmscher. Var. nov.

Dense caespitosa. Caules inferne rufescentes et parce, ad foliorum axillas dense et longe fusco-pilosi. Folia caulina elliptica vel oblongo-elliptica, 10-11 mm. longa, 3-4 mm. lata pilis brevibus glanduliferis plus minusve dense obsita. Pedicelli breviter glanduloso-pilosi; petala quam sepala 3-plo longiora ovalia vel oblongo-ovata obtusa 7-8 mm. longa, 3-4 mm. lata, callosa.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 10,500-11,000 ft. Dry, shady ledges of limestone cliffs. (Tufted plant of 3-4 inches. Flowers deep orange striped reddish-orange, anthers orange, filaments reddish. The whole plant when fresh has a smell similar to that of fresh rhubarb root.)" G. Forrest. No. 2947. September 1906.

"Lat. 27° 30' N. Alt. 14-15,000 ft. Stony, moist pasture." G. Forrest. No. 6221 pr. p. July 1910.

"Lat. 27° 35' N. Alt. 14,000 ft. Stony alpine pasture. (Tufted plant of 3-5 inches. Flowers deep orange striped longitudinally, red-orange.)" G. Forrest. No. 6636 pr. p. September 1910.

(5) var. **hypericoides** (Franch. Journ. de Bot. (1896), p. 261, pro specie), Engl. et Frmscher.

Caules plerumque 3-flori, inferne rufescentes, saepe fusco-lanuginosi, ad apicem usque conferte foliati. Folia caulina

breviter *lineari-lanceolata* 5-plo longiora quam lata, plus minusve glandulosa-pilosa. Petala oblongo-obtusa circ. 5-7 mm. longa, 2-2.5 mm. lata.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 15' N. Alt. 11-12,000 ft. Ledges and clefts of cliffs. (Plant of 2½-4 inches. Flowers orange.)" G. Forrest. No. 2576. July 1906.

"Lat. 27° 30' N. Alt. 13,000 ft. Stony alpine pasture. (Plant of 4-6 inches. Flowers deep orange.)" G. Forrest. No. 6439. August 1910.

fa. *latifolia*, Engl. et Frmscher.

Differt foliis caulinis magis confertis lanceolato-ellipticis circ. 8-9. mm. longis, 3.5 mm. latis, 3-plo longioribus quam latis.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 15' N. Alt. 11,000 ft. Ledges of cliffs and dry, rocky mountain pasture. (Tufted plant of 4-6 inches. Flowers deep orange.)" G. Forrest. No. 2863. September 1906.

(a) subvar. *macrantha*, Engl. et Frmscher.

Caules erecti 1.2-1.3 dm. longi, 2-3-flori. Folia caulina lanceolato-elliptica, circ. 11 mm. longa, 5 mm. lata. Petala oblongo-ovata 8 mm. longa, 4 mm. lata.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 11-12,000 ft. Forming clusters on ledges and in crevices of cliffs and boulders. (Plant of 4-9 inches. Flowers orange, anthers same colour.)" G. Forrest. No. 2757. August 1906.

SUB-SECT. TURFOSAE.

Caules ad basim atque ad foliorum axillas pilis rufescentibus crispulis instructi, aequaliter foliati aut foliis inferioribus quam media minoribus. Folia basalia deficientia; caulina lanceolata vel elliptica, sessilia, 3-4 cm. longa.

Saxifraga subamplexicaulis, Engl. et Frmscher. Sp. nov.
Plate xciii.

Dense caespitosa; caulibus erectis 2-2.5 dm. longis aequaliter laxe foliatis, pauci-(1-3)-floris, tota longitudine pallidis glabris, summo apice dense breviter glanduloso-pilosis. Folia caulina conformia, sessilia, integra, lanceolato-ovata obtusa, cordato-subamplexicaulia, circ. 2.5-3 cm. longa, circ. 6 mm. lata, inferiora et media glabra vel margine infimo paullum et laxe longe fuscopilosa, suprema et folia floralia margine pilis brevissimis glanduliferis densissime obsita. Pedicelli ex axillis summorum foliorum

orientes quam flores 2-3-plo longiores, dense breviterque nigro-glandulosi; sepala in anthesi horizontaliter patentia, in fructu reflexa, ovata acuta, 2.5-3 mm. longa, 1.5-2 mm. lata, subtus atque margine breviter glanduloso-pilosa, trinervia, nervo medio sub apice verruculam formante, nervis superne non confluentibus; petala oblongo-ovata in unguem brevem contracta, 6-6.5 mm. longa, 3 mm. lata, trinervia, ecallosa, aurantiaca; stamina pistillum fere aequantia; ovarium late ovoideum in stilos brevissimos stigmatibus parvis instructis exiens, loculis fere omnino connatis. Capsula . . .

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 10' N. Alt. 11-12,000 ft. On humus-covered boulders in side valleys. (Tufted plant of 6-10 inches. Flowers orange, with anthers the same colour.)" G. Forrest. No. 2965. September 1906.

***Saxifraga turfosa*, Engl. et Frmscher. Sp. nov. Plate xciv.**

Caules erecti 2.4-4 dm. longi densiuscule foliati, pluri-(3-12)-flori, inferne rufescentes glabri, superne pallidi pilis brevissimis glanduliferis dense obsiti, ad basim stolonibus 9-10 cm. longis laxe foliatis. Folia basalia atque caulina infera (si adsunt) lanceolata obtusa, in petiolum laminae aequilongum angustata, 2.5-3 cm. longa, circ. 8 mm. lata, glabra, caulina media et superiora suberecta, sessilia, oblongo-lanceolata, coriacea, media sensim in minora superiora transeuntia circ. 2-4 cm. longa, 0.8-1 cm. lata, glabra, superiora quam media angustiora 1.5-2 cm. longa, 3-4 mm. lata, margine et saepe supra brevibus pilis glanduliferis dense obsita. Flores hermaphroditi dichogami proterandri; pedicelli ad basim bracteolati quam flores 2-3-plo longiores, brevissime atque dense glanduloso-pilosi; sepala in anthesi reflexa, oblongo-ovata, 5 mm. longa, medio 2.5 mm. lata, pilis brevibus glandulosis multicellularibus margine saepe uniseriatis superne plerumque multiseriatis obsita, trinervia, nervis sub apice non confluentibus; petala ovalia vel oblongo-ovata brevissime unguiculata, circ. 10 mm. longa, 5 mm. lata, trinervia, nervis lateralibus saepe bifidis, ecallosa, aurantiaca; stamina pistillum primum superantia, deinde aequantia; ovarium ovoideum in stilos breves erectos stigmatibus parvis instructis exiens, loculis fere omnino connatis. Capsula oblongo-ovoidea stilis brevibus divaricatis.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 10' N. Alt. 10,000 ft. Boggy, stony situations. (Plant of 7-14 inches. Flowers golden-yellow.)" G. Forrest. No. 123. September 1904.

"Lat. 27° 12' N. Alt. 9-10,000 ft. Marshy mountain meadows.

(Plant of 14-18 inches. Flowers orange-yellow, anthers same.)" G. Forrest. No. 2988. September 1906.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 8-9000 ft. Boggy mountain pastureland. (Plant of 12-18 inches. Flowers orange, anthers same.)" G. Forrest. No. 4206. October 1906.

"Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 9000 ft. Marshy pasture. (Plant of 10-18 inches. Flowers golden-yellow.)" G. Forrest. No. 6999. 1910.

Saxifraga Moorcroftiana, Wall. Cat. No. 453.

"N.W. Yunnan, western flank of the Lichiang Range. Lat. 27° 30' N. Alt. 12,000 ft. Moist situations amongst willow and rhododendron scrub. (Plant of 9-15 inches. Flowers golden-yellow.)" G. Forrest. No. 6367. August 1910.

SUB-SECT. STELLARIIFOLIAE.

Caules ad basim atque ad foliorum axillas pilis rufescentibus crispulis instructi, aequaliter foliati vel foliis inferioribus quam media minoribus. Folia basalia deficientia; caulina cordato-ovata, saepe petiolata.

Saxifraga cardiophylla, Franch. Nouv. Arch. Mus. Paris, ser. ii, viii (1886), p. 230.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 9-10,000 ft. Open mountain grassland. (Plant of 8-10 inches. Flowers orange-yellow, anthers same.)" G. Forrest. No. 5058. August-September 1906.

"Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-11,000 ft. Shady pasture on the margins of forests. (Plant of 12-16 inches. Flowers pale yellow.)" G. Forrest. No. 6942. 1910.

SUB-SECT. HIRCULOIDEAE.

Caules ad basim atque ad foliorum axillas pilis rufescentibus crispulis instructi, inaequaliter foliati, foliis basalibus longe petiolatis quam caulina saepe maioribus. Folia caulina a basi usque ad caulis apicem magnitudine sensim decrescentia.

Saxifraga nigroglandulosa, Engl. et Frmscher. Sp. nov. Plate xcv.

Laxe caespitosa, surculis prostratis deficientibus. Caules breves 0.5-1.5 dm. longi, laxe foliati, plerumque uniflori, raro

biflori, inferne rufescentes et parce, ad foliorum axillas dense longe fusco-pilosi, superne pilis longis glanduligeris nigris dense obsiti. Folia basalia atque caulina infera 3-2 cm. longe petiolata, lamina spathulata vel lanceolata 1-2 cm. longa, 6-4 mm. lata, supra sparse pilosa; folia caulina superiora sessilia lanceolata obtusa. Flores majusculi, hermaphroditi dichogami proterandri, laterales (si adsunt) longius pedicellati; sepalia in anthesi non reflexa, ovata obtusa 4.5-5.5 mm. longa, inferne dense et margine hyalino sparse pilis longis glanduliferis nigris obsita, 5-nervia, nervis sub apice in verruculam confluentibus; petala obovata subaurantiaca quam sepalia 1.5-plo longiora, 8-10.5 mm. longa, circ. 4.5 mm. lata, 5-nervia, supra multis callis minutis disperse oblecta; stamina pistillum primum superantia; ovarium late ovoideum in stilos breves stigmatibus parvis instructis exiens. Capsula. . . .

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 11-12,000 ft. Limestone cliffs and humus-covered boulders. (Tufted plant of 2-4 inches. Flowers orange-yellow.)" G. Forrest. Nos. 2910, 2910A. September 1906.

"Lat. 27° 30' N. Alt. 14-15,000 ft. Moist, stony pasture. (Plant of 1-3 inches. Flowers golden-yellow.)" G. Forrest. No. 6222. July 1910.

"Lat. 27° 35' N. Alt. 14,000 ft. Moist, peaty, alpine pasture. (Matted plant of 2-4 inches. Flowers golden-yellow.)" G. Forrest. No. 6359. August 1910.

"Lat. 27° 20' N. Alt. 15,000 ft. Stony, alpine pasture. (Plant of 4-6 inches. Flowers deep golden-yellow.)" G. Forrest. No. 6376. August 1910.

Nota.—Haec planta habitu *Saxifragae chumbiensi*, Engl. et Frmscher valde similis, attamen ab illa differt foliis caulinis magis approximatis et paullum latoribus, caule superne nigro-glanduloso, sepalis nigro-glandulosis, petalis multi-callosis. Haec et illa *Saxifragae Hirculo* valde affines, ut etiam ei sub titulo subspecierum adjungi possint.

***Saxifraga tsangchanensis*, Franch. Pl. Delav. (1878), p. 233.**

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 11-12,000 ft. Open, dry situations on ledges of cliffs in side valleys. (Tufted plant of 1½-2 inches. Petals orange, anthers yellow.)" G. Forrest. No. 4200. September 1906.

"Lat. 25° 40' N. Alt. 11,000 ft. Exposed, grassy slopes. (Plant of 3-6 inches. Flowers orange, anthers the same.)" G. Forrest. No. 4211. September-October 1906.

"Lat. 25° 40' N. Alt. 12,000 ft. Moist, stony pastures.

(Plant of 2-4 inches. Flowers golden-yellow.)" G. Forrest. No. 6943. 1910.

Saxifraga Forrestii, Engl. et Frmscher. Sp. nov. Plate xcvi.

Dense caespitosa, caulibus brevibus 0.5-1 dm. longis, laxe foliatis, plerumque pluri- (2-4)-floris, raro unifloris, glabris, inferne rufescentibus, ad foliorum axillas saepissime fusco-pilosis. Folia basalia copiosa, in caulina haud transeuntia, 1-1.5 cm. longa, in petiolum quam laminae circ. duplo longiorem angustata, lamina spathulata vel lanceolata circ. 3-6 mm. longa, 1.5-2 mm. lata, supra rufescenti-pilosa, caulina sessilia lanceolata obtusa, saepe supra fusco-pilosa. Pedicelli interdum pilis brevibus glanduligeris nigris dense obtecti, floribus circ. 3-4-plo longiores; sepala anthesi reflexa, oblonga obtusa, 3 mm. longa, margine pilis minutis multicellularibus uniserialibus laxe obsita, parallele trinervia; petala aurantiaca oblongo-elliptica, trinervia, in unguem contracta, circ. 6 mm. longa, 2-2.5 mm. lata, ecallosa; stamina pistillum fere aequantia, ovarium ovoideum in stilos breves stigmatibus parvo coronatis exiens. Capsula oblongo-ovata.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 10,000 ft. On banks and humus-covered boulders. (Plant of 2-4 inches. Flowers bright yellow.)" G. Forrest. No. 6575. September 1910.

"Lat. 27° 30' N. Alt. 10-11,000 ft. On rocks and dry, shady banks. (Plant of 3-5 inches. Flowers orange-yellow.)" G. Forrest. No. 6716. September 1910.

Nota.—Haec planta valde affinis *Saxifragis tsangchanensis* et *subspathulatae*, ab illa differt sepalis parallele trinerviis, anthesi reflexis, ab hac petalis unguiculatis atque foliis basalibus rufescenti-pilosis.

Saxifraga diversifolia, Wall.

Dispositio varietatum atque formarum.

(A) Sepala nervis in verruculam non confluentibus, plerumque parallelis.

(1) *diversifolia typica*.

(a) fa. *foliata*, Engl. et Frmscher.

(b) fa. *haematophylla* (Franch. pro var.).

In collectione Forrestiana deest.

(c) fa. *parviflora* (Franch. pro var.).

In collectione Forrestiana deest.

(d) fa. *alpina*, Engl. et Frmscher.

(e) fa. *angustibracteata*, Engl. et Frmscher.

(2) var. *Souliana*, Engl. et Frmscher.

In collectione Forrestiana deest.

(B) Sepala nervis in verruculam confluentibus.

(3) var. *parnassifolia*, Don.

In collectione Forrestiana deest.

(1) *diversifolia typica*.

(a) fa. *foliata*, Engl. et Frmscher.

Caules erecti 1.4-5 dm. longi uni- vel plurifoliati, pluri-(3-20)-flori. Folia margine *glabra* vel *brevissime* dense *glanduloso-pilosa*, basalia atque caulina infera longe petiolata lamina subcordato-ovata subacuta vel cordata, in caulina media transeuntia, media breviter petiolata, saepe sessilia, oblongo-ovata obtusa vel late ovata subacuta, 2-5 cm. longa, 1-4 cm. lata. Petala circ. 7 mm. longa.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 12' N. Alt. 11-12,000 ft. Moist, shady situations on mountain pastureland. (Plant of 6-15 inches. Flowers bright orange.)" G. Forrest. No. 2864. September 1906.

"Lat. 27° 20' N. Alt. 12,000 ft. Moist cliffs and rocks. (Plant of 6-12 inches. Flowers golden-yellow.)" G. Forrest. No. 6342. August 1910.

"Lat. 27° 30' N. Alt. 13,000 ft. Cane brakes and rhododendron forests. (Plant of 12-16 inches. Flowers golden-yellow.)" G. Forrest. No. 6651. September 1910.

"W. Yunnan, on the western slopes of the Tali Range, near the head of the Yang-pi valley. Lat. 25° 40' N. Alt. 9-12,000 ft. Grassy, shady situations. (Plant of 1-2 ft. Flowers orange-yellow.)" G. Forrest. No. 983. September 1905.

(d) fa. *alpina*, Engl. et Frmscher.

Dense caespitosa. Caules erecti 1-2 dm. longi, densiuscule foliati, uni-vel pluri-(3)-flori. Folia margine pilis longis fuscis dense, lamina laxe obsita, basalia et caulina inferiora longe petiolata, lamina cordato-ovata subacuta 2-2.5 cm. longa, 1.5-2 cm. lata in media transeuntia, media et superiora ovata subacuta, plus minusve breviter petiolata vel sessilia. Petala circ. 1 cm. longa.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 30' N. Alt. 13-14,000 ft. Stony, alpine pasture. (Plant of 3-7 inches. Flowers golden-yellow.)" G. Forrest. Nos. 6358, 6506, 6615, 6666. August 1910.

"Lat. 27° 30' N. Alt. 14-15,000 ft. Stony, alpine pasture. (Plant of 3-5 inches. Flowers deep orange-yellow.)" G. Forrest. No. 6375. August 1910.

(e) *fa. angustibracteata*, Engl. et Frmscher.

Caules erecti 1·2–2·4 dm. longi laxe foliati, pluri-(3–30)-flori. Foliorum petioli subglabri; folia basalia et caulina infera longe petiolata cordato-ovata obtusa, lamina 2–4 cm. longa, 2–3·5 cm. lata, plerumque in caulina media *non* transeuntia; media et superiora sessilia, lamina ovata lanceolata 1–1·5 cm. longa, 0·3–0·5 cm. lata. Flores quam aliarum formarum minores, petala circ. 3–6 mm. longa.

"N.W. Yunnan, on the ascent of the Nin Chang pass from Ke-Ho-wan on the Yangtze to the Chung-Tien plateau. Lat. 27° 40' N. Alt. 11–13,000 ft. Moist, rocky situations. (Plant of 6–12 inches. Flowers golden-yellow.)" G. Forrest. No. 115. September 1904.

"W. Yunnan, on the eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 9–11,000 ft. Moist, shady situations in pine forests. (Plant of 6–12 inches. Flowers orange, anthers same shade.)" G. Forrest. Nos. 4207, 5056. August–September 1906.

"Lat. 25° 40' N. Alt. 10,000 ft. Moist, shady situations on the margins of pine forests. (Plant of 10–15 inches. Flowers yellow.)" G. Forrest. No. 6843. 1910.

"Lat. 25° 40' N. Alt. 11,000 ft. On rocks in moist, shady pine forests. (Plant of 6–10 inches. Flowers orange.)" G. Forrest. No. 7234. 1910.

SUB-SECT. NUTANTES.

Caules inferne glabri. Petioli foliorum basaliū pilis rufescentibus crispulis sparsissime instructi. Inflorescentia pseudoracemosa, secunda; flores nutantes.

Saxifraga nutans, Hook. f. et Thoms. Journ. Linn. Soc. ii (1857), p. 69.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 11–12,000 ft. Grassy, stony slopes at the base of limestone cliffs. (Plant of 6–12 inches. Flowers pale canary-yellow.)" G. Forrest. No. 2621. July 1906.

"Lat. 27° 30' N. Alt. 12,000 ft. Open, stony pasture. (Plant of 6–12 inches. Flowers bright yellow.)" G. Forrest. No. 6599. August 1910.

SUB-SECT. GEMMIPARAE.

Caules parte inferiore pilis plerumque incoloratis saepe glanduliferis hispidis obsiti, raro glabri (*S. brachypoda*), aequaliter foliati (excl. formis *S. gemmiparae*), ad foliorum axillas vel ad basim gemmis instructi. Foliorum lamina discolor, subtus albescens, rigida, margine spinulosa.

Saxifraga hispidula, Don. Trans. Linn. Soc. xiii (1822), p. 380, var. ***Doniana***, Engl. Monogr. Saxifr., p. 222.

"Yunnan, ascent of the Ninchang pass from Ke-Ho-wan on the Yangtse. Alt. 11-12,000 ft. Dry, rocky situations." G. Forrest. No. 114. September 1904.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 12' N. Alt. 11-12,000 ft. Moss-covered rocks and grassy slopes. (Plant of 3-6 inches. Flowers orange-yellow.)" G. Forrest. No. 2696. August 1906.

"Lat. 27° 30' N. Alt. 10-11,000 ft. On rocks in shady situations. (Tufted plant of 2-5 inches. Flowers deep orange.)" G. Forrest. No. 6440. August 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 10-11,000 ft. Ledges and crevices of cliffs in side valleys. (Tufted plant of 3-6 inches. Flowers orange, anthers same shade.)" G. Forrest. Nos. 4208, 5062. September 1906.

"Lat. 25° 40' N. Alt. 9-10,000 ft. Dry stony pasture and on boulders. (Tufted plant of 3-6 inches. Flowers orange.)" G. Forrest. No. 7073. 1910.

Saxifraga brachypoda, Don. Trans. Linn. Soc. xiii (1822), p. 378.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 11-12,000 ft. Dry shady situations on ledges of cliffs in side valleys. (Tufted plant of 1-3 inches. Flowers yellow, anthers deep red.)" G. Forrest. No. 4201. October 1906.

"Lat. 25° 40' N. Alt. 10-11,000 ft. Dry banks in shady pine forests. (Plant of 2-4 inches. Flowers golden-yellow.)" G. Forrest. No. 6941. 1910.

var. ***fimbriata*** (Wall.), Engl. et Frmscher.

"N.W. Yunnan, open heathy situations on the summit of the Kari pass between Pung-tzu-la and the Shu-pa valley." G. Forrest. No. 89. September 1904.

"Eastern flank of the Lichiang Range. Lat. 27° 15' N. Alt. 11-12,000 ft. Dry ledges of cliffs and on humus-covered boulders.

(Plant of 6-9 inches. Flowers yellow, anthers same colour.)" G. Forrest. No. 2867. September 1906.

"Lat. $27^{\circ} 25' N$. Alt. 10-11,000 ft. Stony grassland on the margins of mixed forests. (Plant of 4-9 inches. Flowers golden-yellow.)" G. Forrest. No. 6627. August 1910.

Saxifraga gemmipara, Franch. Journ. de Bot. (1896), p. 262.

"Yunnan, mountains of the Mekong and Yangtse basins. Alt. 10-14,000 ft. Common on rocky situations." G. Forrest. Nos. 104, 113. September 1904.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. $27^{\circ} 10'-27^{\circ} 25' N$. Alt. 9-10,000 ft. Dry, open, rocky situations. (Procumbent plant of 4-8 inches. Flowers white, anthers orange.)" G. Forrest. No. 2926. September 1906.

"W. Yunnan, eastern flank of the Tali Range. Lat. $25^{\circ} 40' N$. Alt. 9-10,000 ft. Open, dry, rocky pastureland. (Plant of 6-12 inches. Flowers white, base of petals yellowish.)" G. Forrest. Nos. 4210, 5060. July-August 1906.

"Lat. $25^{\circ} 40' N$. Alt. 8000 ft. Dry, stony pasture and on ledges of cliffs. (Plant of 4-6 inches. Flowers creamy-white.)" G. Forrest. No. 6995. 1910.

Saxifraga Balfourii, Engl. et Frmscher. Sp. nov. Plate xcvi.

Caudiculi hypogaei gemmiferi, caespitem densum formantes. Caules erecti saepe ramosi 1.0-1.6 dm. longi, ramis plerumque pluri-(2-4)-floris, densiuscule foliati, inferne fusco-pubescentes et gemmiferi, superne dense glanduloso-pilosi. Gemmarum cataphylla linearia, albomarginata, ciliata. Folia caulina sessilia, pilis glanduligeris brevibus haud coloratis utrinque densiuscule obsita, subtus albescentia, inferiora quam media minora, suborbicularia vel late elliptica, media elongato-elliptica, utrinque acuta, 14-16 mm. longa, 5-9 mm. lata, multinervia, nervis supra prominulis, apice in aristam persistentem primum glandula coronatam desinentia. Pedicelli supra basin bracteolati, quam flores duplo longiores, dense breviterque nigro-glandulosi; sepala oblongo-ovata, acuta, circ. 3-3.5 mm. longa, 1.5 mm. lata, subtus et margine dense nigro-glandulosa, trinervia, nervis sub apice confluentibus, in anthesi horizontaliter patentia; petala obovata vel obovato-oblonga breviter unguiculata, 5-7 mm. longa, 3-3.5 mm. lata, trinervia, ecallosa lutea; stamina pistillum paullum superantia; ovarium oblongum stilibus gracilibus ovario aequilongis primum erectis, demum saepe divaricatis instructum, loculis fere usque ad basim disjunctis. Capsula oblonga, stilibus divaricatis.

"Yunnan, on the descent from pass between Teng Chuan and Sung Kwei valleys. Alt. 10-11,000 ft. Moist rocky situations." G. Forrest. No. 74. September 1902.

"Near Sung Kusi. Alt. 12,000 ft." G. Forrest. No. 1140. September 1904.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 11-12,000 ft. Crevices of cliffs and boulders. (Plant of 3-10 inches. Flowers orange-yellow, anthers red.)" G. Forrest. No. 2756. August 1906.

"Lat. 27° 35' N. Alt. 13,000 ft. Stony, alpine pasture. (Tufted plant of 6-10 inches. Flowers orange.)" G. Forrest. No. 6650. September 1910.

Saxifraga filicaulis, Wall. Cat. No. 445.

"Yunnan, near Sung Kusi. Alt. 12,000 ft." G. Forrest. No. 1141. September 1904.

"Ascent of the Nin Chang pass to Chung Tien plateau, also abundant in places on plateau. Alt. 10-14,000 ft. Rocky situations." G. Forrest. No. 170. September 1904.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 15' N. Alt. 9-12,000 ft. Dry ledges and crevices of cliffs. (Procumbent plant of 6-9 inches. Flowers golden-yellow.)" G. Forrest. No. 2749. July 1906.

"Lat. 27° 30' N. Alt. 9-11,000 ft. On cliffs, boulders, and dry, stony pasture. (Plant of 4-10 inches. Flowers yellow.)" G. Forrest. No. 6515. September 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. 27° 40' N. Alt. 11-12,000 ft. Dry, exposed rocky situations. (Tufted plant of 3-10 inches. Flowers orange, anthers same.)" G. Forrest. No. 4209. September 1906.

"Eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 9-11,000 ft. Dry banks in pine forests. (Matted plant of 3-10 inches. Flowers orange-yellow.)" G. Forrest. No. 6871. 1910.

SUB-SECT. CINERASCENTES.

Caules pilorum rufescentium crispulorum destituti, inaequaliter foliati, foliis basalibus rosulatis confertis, rigidis, margine cartilaginea spinulosa atque aristata; caules floriferi oligophylli.

Saxifraga cinerascens, Engl. et Frmscher. Sp. nov. Plate xcvi.

Dense caespitosa, caudiculis epigaeis rosulatis foliatis. Caules floriferi oligophylli, uni-triflori, inferne, saepe tota longi-

tudine rufescentes, pilis nigro-glandulosis aequaliter obsiti. Folia caudicularum in caulina minora non transeuntia, rigidula, lineari-lanceolata, 7-10 mm. longa, 1.5-2.5 mm. lata, margine cartilagineo laxè ciliata vel ciliato-spinulosa, apice in aristam persistentem excurrentia, subtus albescentia nitida, caulina lanceolata, 4-6 mm. longa, 1.5-2 mm. lata, rigidula, margine *pilis brevibus nigro-glandulosis dense obsita*, aristata. Pedicelli nigro-glandulosi, quam flores 1-2-plo longiores. Flores hermaphroditi dichogami proterandri; sepala in anthesi non reflexa, oblongo-ovata subacuta, 3 mm. longa, 1-1.5 mm. lata, superne margine et subtus pilis brevissimis nigro-glandulosis obsita, apice hyalino trinervia, nervis sub apice non confluentibus; petala obovata, 5.5-6.5 mm. longa, 3 mm. lata, in petiolum angustata, trinervia, nervis lateralibus bifidis, juxta laterales ad basim callosa, lutea. Stamina primum pistillum superantia, deinde aequantia; ovarium oblongo-ovoideum, in stilos dimidium ovarii aequantes vel paulum longiores saepe divaricatos exiens. Capsula . . .

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 15' N. Alt. 10-11,500 ft. On humus-covered boulders and dry ledges of cliffs. (Plant of 2-4 inches. Flowers golden yellow, anthers the same shade.)" G. Forrest. Nos. 2034, 3034. September 1906.

fa. **major**, Engl. et Frmscher.

Folia caudicularum 13-20 mm. longa, 3-5 mm. lata, caulina 7-10 mm. longa, 2 mm. lata.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 25' N. Alt. 12,000 ft. On rocks and boulders." G. Forrest. No. 6628 pro parte. September 1910.

SUB-SECT. SEDIFORMES.

Caules parvi 6-8 cm. longi, glabri vel dense glanduloso-pilosi, pilis rufescentibus crispulis destituti, inaequaliter foliati, foliis basalibus semper rosulatis confertis. Folia raro ultra 1 cm. longa spathulata vel ovato-oblonga integra, rarissime ad apicem versus grosse dentata, non cartilagineo-marginata neque -aristata.

Saxifraga signata, Engl. et Frmscher. Sp. nov. Plate xcix.

Caules erecti 0.8-1.8 dm. longi laxè aequaliter foliati, pluri-(5-17)-flori, tota longitudine atrovioleaei densissime pilis brevibus glandulosis violaceis obsiti. Folia basalia spathulata rosulatis dense conferta 1-1.5 cm. longe petiolata, lamina orbiculari-ovata vel rhomboidea 3-5 mm. longa, 2-4 mm. lata, margine pilis

brevibus setosis dense obsita, caulina oblongo-spathulata 10-15 mm. longa, 3-4 mm. lata, supra atque margine pilis violaceo-glandulosis instructa. Flores majusculi hermaphroditi dichogami proterandri; inflorescentiae racemosae rami laterales angulo 60°-80° patentes 6-7 cm. longi plerumque bibracteolati, biflori, atroviolecei, ut pedicelli pilis brevibus violaceo-glandulosis densissime obsiti; sepala in anthesi reflexa, lineari-lanceolata, obtusa, 7-9 mm. longa, 2-3 mm. lata, margine et laminae parte superiore breviter glanduloso-pilosa, trinervia, nervis sub apice confluentibus, lateralibus bifidis; petala oblongo-ovata, in unguem abrupte angustata, circ. 8 mm. longa, 3-4 mm. lata, trinervia, basi juxta nervos laterales ecallosa, aurantiaca, margine inferiore dimidio purpureo-punctulata; stamina pistillum primum superantia; ovarium late ovoideum in stilos brevissimos conniventes vel erectos stigmate parvo instructos exiens, atro-viride. Capsulae ovoideae stili breves divaricati.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 25' N. Alt. 11-12,000 ft. Open situations on limestone drift at the base of cliffs. (Plant of 4-8 inches. All parts, excepting the corolla darkly glandular, petals pale yellow, with the basal half on interior spotted deep maroon, anthers yellow, gynaecium dark green.)" G. Forrest. No. 2958. September 1906.

"Lat. 27° 30' N. Alt. 11-13,000 ft. On limestone drift. (Plant of 4-9 inches. Flowers yellow, lower half of petals striped and marked deep maroon, gynaecium deep maroon.)" G. Forrest. No. 6574. September 1910.

Saxifraga candelabrum, Franch. Pl. Delav. (1890), p. 232.

"Yunnan, on pass between Chung Tien and Tang Tin. Alt. 11-12,000 ft. Rocky banks in pine woods." G. Forrest. No. 50. September 1904.

"Mekong-Salwen divide behind Tzekou Mission." G. Forrest. No. 173. 1904.

Saxifraga sediformis, Engl. et Frmscher. Sp. nov. Plate c.

Dense caespitosa. Caules 4-8 cm. longi, densiuscule aequaliter foliati, pluri-(2-9)-flori, inferne rufescentes, tota longitudine pilis longis glanduliferis subviolaceis obsiti. Folia inferiora confertim rosulata, spathulata, 5-8 mm. longa, 1.5-3 mm. lata, margine dense, supra sparse pilis glanduliferis non coloratis obsita, caulina conformia lanceolato-ovata vel obovata subacuta ad basim sensim angustata, 5-9 mm. longa, 1.5-5 mm. lata, margine atque supra dense fusco-glanduloso-pilosa. Inflorescentiae rami laterales 1-2 cm. longi, bi-tribracteati, 1-3-flori,

ut pedicelli pilis longis fusco-glandulosis dense obsiti; sepala in anthesi reflexa, ovata acuta, 3-3.4 mm. longa, 1.5 mm. lata, subtus atque margine glanduloso-pilosa, trinervia, nervis sub apice in verruculam oblongam confluentibus; petala oblongo-ovata in unguem abrupte angustata, 5-6.5 mm. longa, 2-2.5 mm. lata, trinervia, basi juxta nervos laterales callosa, lutea; stamina pistillum fere aequantia; ovarium oblongo-ovoideum in stilos dimidium ovarii aequantes stigmatibus parvis instructis exiens. Capsula ovoidea stylis divaricatis coronata.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 12-13,000 ft. Open situations on cliffs and humus-covered boulders. (Tufted plant of 2-3 inches. Flowers yellow, anthers dark, ruddy green.)" G. Forrest. No. 2912. September 1906.

"Lat. 27° 20' N. Alt. 12-13,000 ft. On cliffs and rocks. (Tufted plant of 2-4 inches. Flowers golden yellow.)" G. Forrest. No. 6355. August 1910.

***Saxifraga drabaeformis*, Franch. Pl. Delav. (1890), p. 235.**

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 11-12,000 ft. Crevices of limestone rocks and cliffs. (Plant of 1-2½ inches. Flowers deep, rich yellow.)" G. Forrest. No. 2956. September 1906.

"Lat. 27° 20' N. Alt. 12-13,000 ft. Clefts and ledges of cliffs. (Tufted plant of 3-4 inches. Flowers bright golden yellow, anthers same shade.)" G. Forrest. No. 3025. September 1906.

"Lat. 27° 35' N. Alt. 13-14,000 ft. On limestone drift. (Plant of 3-6 inches. Flowers bright orange.)" G. Forrest. No. 6681. September 1910.

***Saxifraga chrysanthoides*, Engl. et Frmscher. Nom. nov.**

(= *S. chrysantha*, Franch., non Asa Gray.)

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 20' N. Alt. 11-12,000 ft. Forming compact masses on humus-covered boulders in beds of mountain streams. (Plant of 1-2 inches. Flowers bright orange, anthers same shade.)" G. Forrest. No. 2786. August 1906.

"Lat. 27° 25' N. Alt. 12-14,000 ft. On moist cliffs and boulders. (Plant of 1-1½ inches. Flowers bright yellow.)" G. Forrest. No. 5998. July 1910.

"Lat. 27° 30' N. Alt. 15,000 ft. Moist, open, stony situations amongst rocks. (Tufted plant of 1 inch. Flowers bright golden yellow.)" G. Forrest. No. 6251. July 1910.

SUB-SECT. FLAGELLARES.

Caules flagellis e rosula orientibus, pilorum rufescentium crispulorum destituti. Folia saepe rigidula spinulosa.

Saxifraga Brunoniana, Wall. Cat. No. 444.

var. **majuscula**, Engl. et Frmscher. Var. nov. Plate ci.

Maior quam typus. Caules 8-16 cm. longi, pluri-(3-9)-flori. Folia basalia 1.5-2 cm. longa, 3-5 mm. lata. Inflorescentia composita, ramis 4-10 cm. longis.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 9-10,000 ft. On boulders in dry, shady situations in side valleys. (Plant of 2-6 inches. Flowers bright yellow, anthers red.)" G. Forrest. No. 4202. October 1906.

"Lat. 25° 40' N. Alt. 10,000 ft. Dry situations on humus-covered boulders and ledges of cliffs. (Plant of 4-8 inches. Flowers golden yellow.)" G. Forrest. No. 7084. 1910.

"Lat. 25° 40' N. Alt. 8-9000 ft. Dry, stony pasture. (Plant of 4-6 inches. Flowers golden yellow.)" G. Forrest. No. 7236. 1910.

SECT. KABSCHIA, Engl.

Linn. xxxv atque ind. crit., p. 4 em.

Saxifraga pulchra, Engl. et Frmscher. Sp. nov. Plate cii.

Dense caespitosa, caudiculis subfruticulosus 1-2 cm. longis foliis dense imbricatis obtectis. Caules floriferi oligophylli 3-5 cm. longi, pilis nigro-glandulosus incoloratis obsiti, pluri-(4-7)-flori. Caudiculorum folia apice reflexa, coriacea, spathulato-lingulata subacuta, 6 mm. longa, 2-2.5 mm. lata, subtus carinata, integra, glabra, basi tantum margine breviter ciliata, antice juxta marginem serie 5-9 (plerumque 7) foveolarum squama calcarea obteatarum instructa; caulina spathulata 5-7 mm. longa, 1-2 mm. lata, dimidio inferiore dense glanduloso-pilosa, supra plurifoveolata. Pedicelli quam flores duplo longiores, dense glanduloso-pilosi; sepala in anthesi et fructu suberecta, ovata obtusa, 3 mm. longa, medio 1.5 mm. lata, margine plerumque glabra, subtus ad basin glanduloso-pilosa, trinervia, nervis sub apice non confluentibus, atropurpurea; petala obovato-oblonga, ad basin sensim in unguem angustata 7-8 mm. longa, 3 mm. lata, trinervia ecallosa, purpurea; stamina petalis fere aequilonga, filamenta et antherae purpureae; ovarium late

globoso-ovoideum in stilos longissimos (5 mm.) divaricatos stigmatē parvo instructos abrupte attenuatum, purpureum. Capsulae loculi late ovoidei, stili divaricati.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 12' N. Alt. 10-11,000 ft. Forming dense, cushion-like masses in clefts of inaccessible limestone cliffs. (Plant of 2-4 inches. Flowers pink.)" G. Forrest. No. 2168. May 1906.

"Lat. 27° 20' N. Alt. 11-12,000 ft. Forming dense, matted cushions 6-12 inches diameter in the crevices of limestone cliffs. (Plant of 2-4 inches. Flowers rose-pink.)" G. Forrest. No. 5966. June 1910.

Saxifraga chionophila, Franch. Journ. de Bot. 1890, p. 265.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 25' N. Alt. 15-16,000 ft. Open situations on limestone drift. (Plant of 1-1½ inches. Flowers olive green, anthers yellow.)" G. Forrest. No. 5904. June 1910.

"Lat. 27° 20' N. Alt. 11,000 ft. Dry limestone cliffs. (Plant of 1-2 inches. Flowers minute, yellow.)" G. Forrest. No. 5778. June 1910.

"Western flank of the Lichiang Range. Lat. 27° 20' N. Alt. 11-12,000 ft. On cliffs and boulders. (Plant of 1-1½ inches. Flowers greenish-maroon.)" G. Forrest. No. 5037. June 1910.

Saxifraga likiangensis, Franch. Journ. de Bot. (1890), p. 266.

"N.W. Yunnan, eastern flank of the Lichiang Range. Lat. 27° 25' N. Alt. 11,000 ft. In a crevice of a limestone boulder. (Tufted plant of 1 inch. Flowers white.)" G. Forrest. No. 6091. July 1910.

BERGENIA, Moench.

Bergenia purpurascens (Hook, f. et Thoms.) Engl. in Nat. Pflanzenfam. iii, 2a (1890), p. 51.

var. **Delavayi** (Franch.), Engl. et Frmscher. *Saxifraga Delavayi*, Franch. in Bull. Soc. Bot. Fr. xxxii (1885), p. 6; *Bergenia Delavayi* (Franch.) Engl. in Nat. Pflanzenfam. iii, 2a (1890), p. 51.

"Yunnan, Chung Tien plateau. Alt. 12-13,000 ft. Dry, grassy hillsides." G. Forrest. Nos. 178, 265. 1904.

"Eastern flank of the Lichiang Range. Lat. 27° 12' N. Alt. 11-12,000 ft. Stony, grassy slopes and on the margins of cane

brakes. (Plant of 1-2 ft. Flowers deep, purplish rose, non-fragrant.)" G. Forrest. No. 2410.

"May 1906. Lat. 27° 20' N. Alt. 12-13,000 ft. Shady situations in rhododendron forests. (Plants of 9-15 inches. Flowers rose-pink.)" G. Forrest. No. 5808. June 1910.

"W. Yunnan, eastern flank of the Tali Range. Lat. 25° 40' N. Alt. 12-13,000 ft. Moist, rocky situations on meadows. (Plant of 4-12 inches. Flowers deep rose-purple.)" G. Forrest. No. 4205. September-October 1906.

"Lat. 25° 40' N. Alt. 11-12,000 ft. Stony, grassy situations in ravines. (Plant of 9-14 inches. Flowers pale rose-purple.)" G. Forrest. No. 5057. July 1906.

"Tibet. Mekong-Salwen divide behind Tzekou mission." G. Forrest. No. 172. 1904.

NOTA.—*Bergenia Delavayi* (Franch.) *Bergeniae purpurascens*, valde affinis modo differt foliis adultis margine distincte crenatis ovali-obovatis paullum longioribus, floribus maioribus, ut huic sub nomine varietatis adjungatur.

LIST OF PLATES.

Illustrating Professor A. Engler and E. Frmscher's Paper on Species of *Saxifraga* and *Bergenia* collected by George Forrest in Yunnan and Eastern Tibet.

The plates are taken from photographs by Mr. R. Adam of dried specimens in the Herbarium of the Royal Botanic Garden, Edinburgh.

PLATE LXXXVII. *Saxifraga humilis*, Engl. et Frmscher. Sp. nov.

LXXXVIII. *Saxifraga clavistaminea*, Engl. et Frmscher. Sp. nov.

LXXXIX. *Saxifraga micranthoides*, Engl. et Frmscher. Sp. nov.

XC. *Saxifraga parvula*, Engl. et Frmscher. Sp. nov.

XCI. *Saxifraga Bulleyana*, Engl. et Frmscher. Sp. nov.

XCII. *Saxifraga petrophila*, Franch., var. *litschiangensis*, Engl. et Frmscher. Var. nov.

XCIII. *Saxifraga subamplexicaulis*, Engl. et Frmscher. Sp. nov.

XCIV. *Saxifraga turfosa*, Engl. et Frmscher. Sp. nov.

XCV. *Saxifraga nigroglandulosa*, Engl. et Frmscher. Sp. nov.

XCVI. *Saxifraga Forrestii*, Engl. et Frmscher. Sp. nov.

XCVII. *Saxifraga Balfourii*, Engl. et Frmscher. Sp. nov.

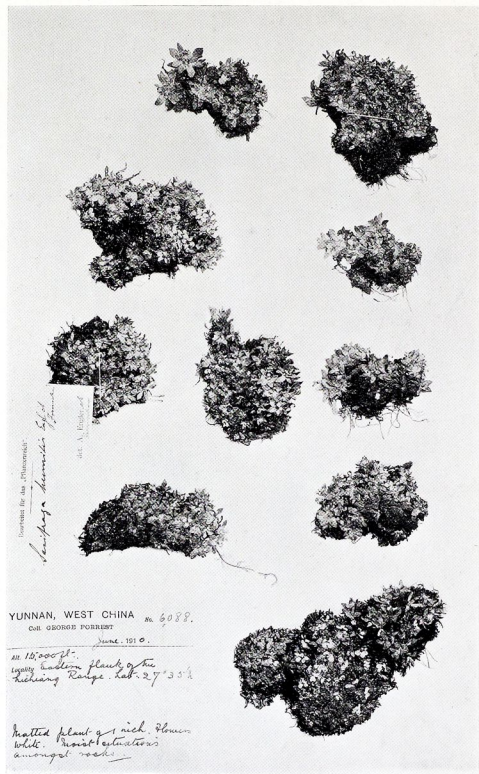
XCVIII. *Saxifraga cinerascens*, Engl. et Frmscher. Sp. nov.

XCIX. *Saxifraga signata*, Engl. et Frmscher. Sp. nov.

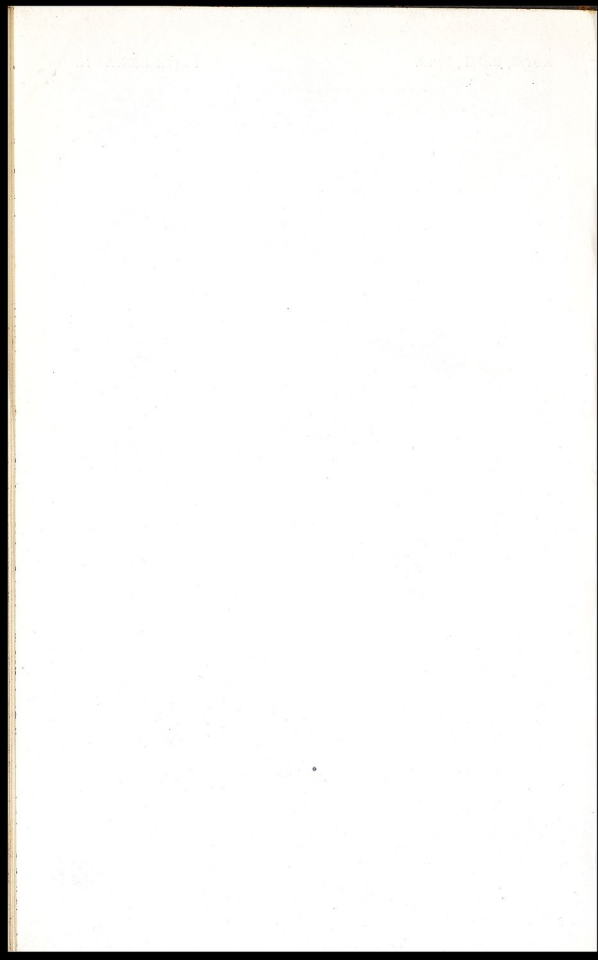
C. *Saxifraga sediformis*, Engl. et Frmscher. Sp. nov.

CI. *Saxifraga Brunoniana*, Wall. var. *majuscula*, Engl. et Frmscher. Var. nov.

CII. *Saxifraga pulchra*, Engl. et Frmscher.



Saxifraga humilis, Engl. et Frmscher.





442. 8. 9.

YUNNAN, WEST CHINA No. 6794.

Coll. GEORGE FORREST

1910,

Alt. 10-11,000 ft.

Locality Eastern flank of the Lali Range. Lat. 25° 40' N.

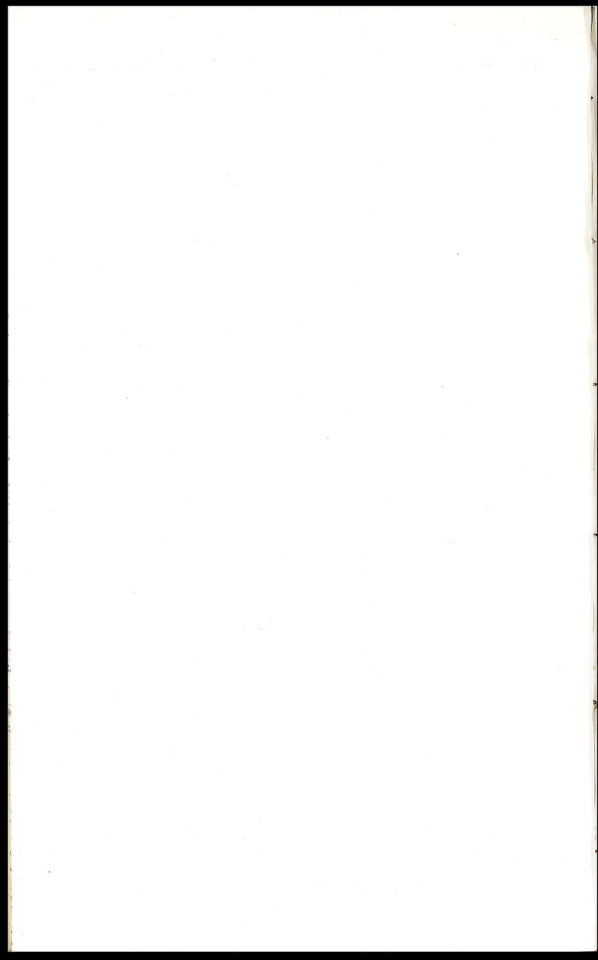
Plant of 2-3 inches. Flowers white. Open along pasture.

Isolated for the "Himalayas".

Saxifraga clavistaminea Engl. et Frmscher

det. A. Engelm.

Saxifraga clavistaminea, Engl. et Frmscher.





Bearbeitet für das "Pharmazeutisch."
Saxifraga micranthoides Engl.

det. A. Engler.

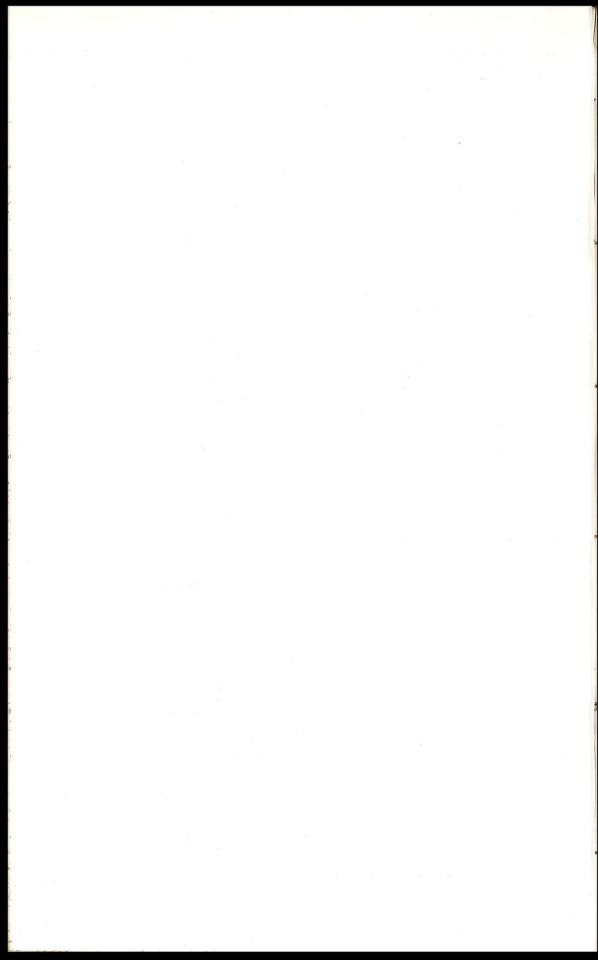
YUNNAN, WEST CHINA No. 6206
 Coll. GEORGE FORREST

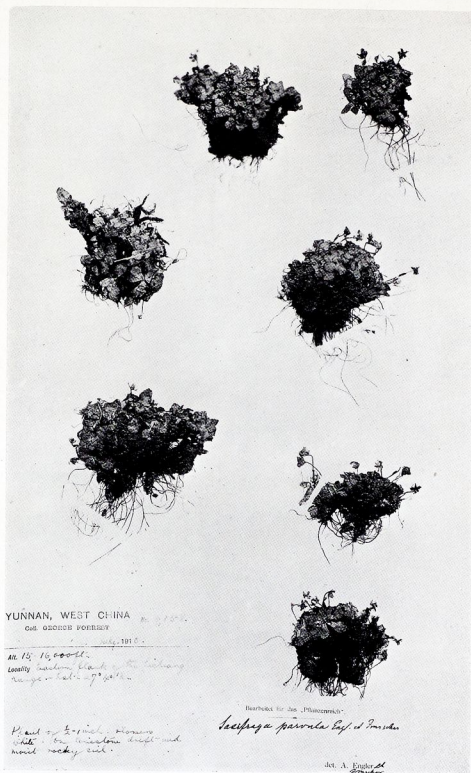
July 1910.

Alt. 11-12000ft...
 Locality: Eastern flank of the Lichang Range. Lat. 27° 26' N.

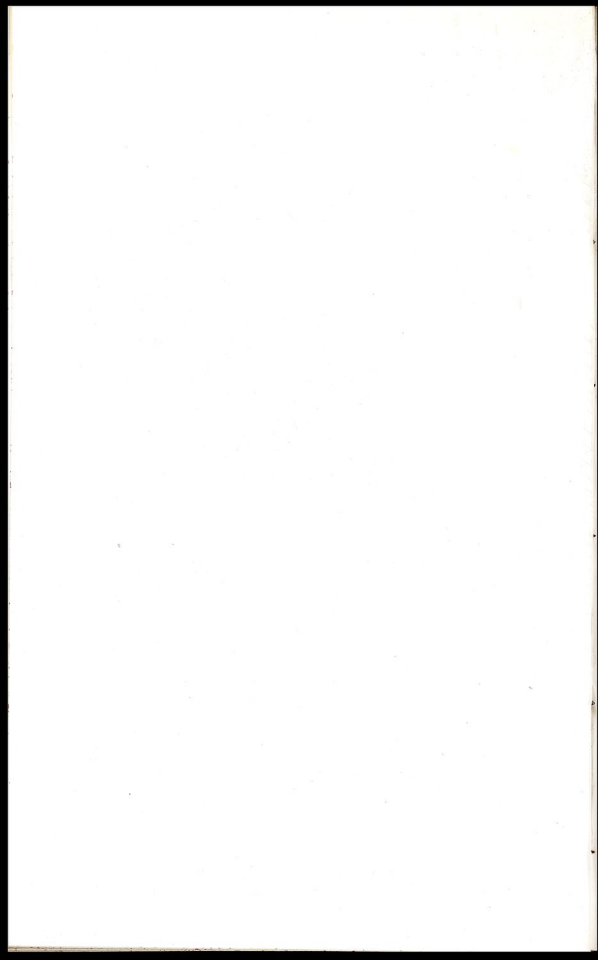
Plant 2-5 inches. Flowers
 white, for leaves covered
 boulders and ledging cliffs.

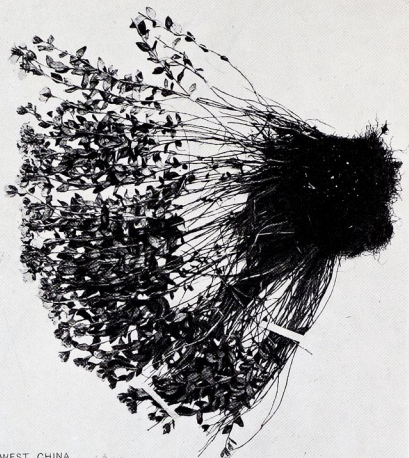
Saxifraga micranthoides, Engl. et Frmscher.





Saxifraga parvula, Engl. et Frmscher.





YUNNAN, WEST CHINA *ca. 8,000 ft.*
COL. GEORGE FOREST

Aug. 1910.

Alt. 12,100 ft.

Locality *Western flank of Mt.*
Kichang Range. Lat. 27° 00' N.

Upland plant 2-6 inches.
Flowers golden yellow. Root
strongly aromatic.

Described for the "Phytographia".

Saxifraga Bulleyana Engl. et Frmscher

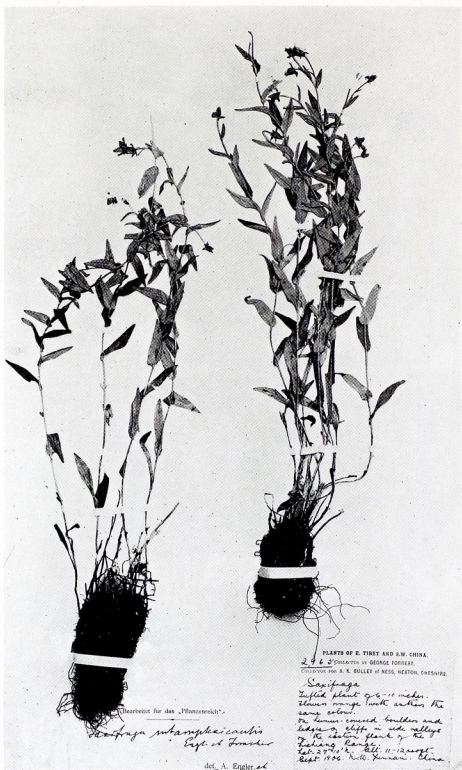
det. Engelm. et Frmscher

Saxifraga Bulleyana, Engl. et Frmscher.



Saxifraga petrophila, Franch., var. *lichiangensis*, Engl. et Frmscher.

1800

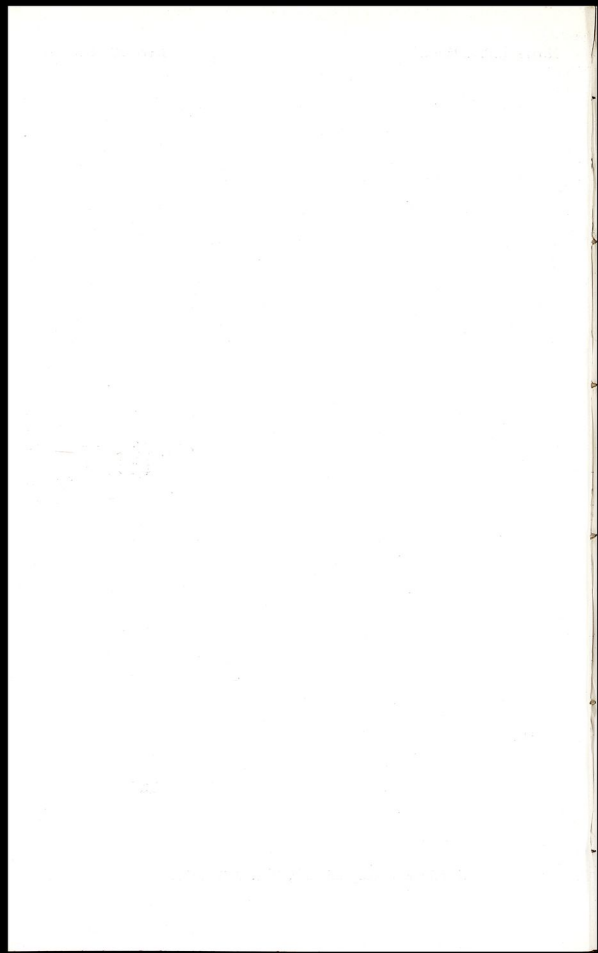


Arbeiten für das „Pflanzenreich“.
Saxifraga subamplexicaulis
 Engl. et Frmscher

det. A. Engler. et

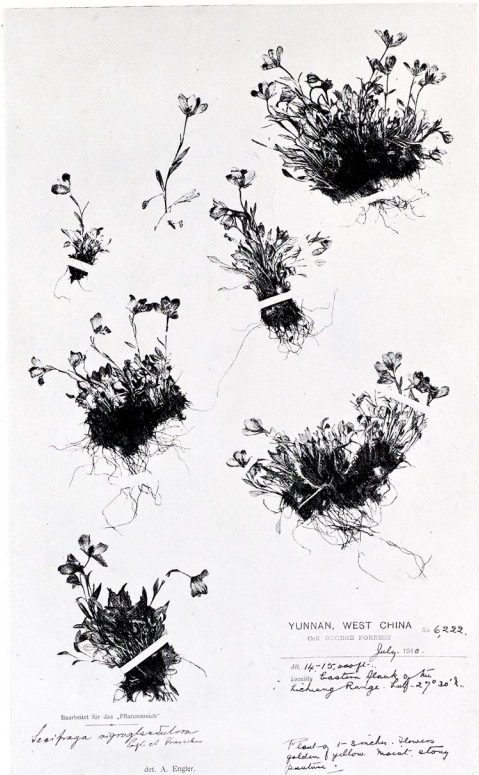
PLANTS OF E. TIBET AND S.W. CHINA.
 2465 COLLECTED BY GEORGE FORBES.
 COLLECTOR FOR A. R. HOLLEY OF NESS, NESTON, CHESHIRE.
Saxifraga
 Leafy plant 9-11 inches.
 Flowers orange (with anthers the
 same colour).
 On humus-covered boulder and
 ledge of cliffs in side valleys
 of the eastern flank of the
 Tachang Range. Alt. 11-12,000 ft.
 Sept. 27-1906. H. W. Kuhn. China.

Saxifraga subamplexicaulis, Engl. et Frmscher.

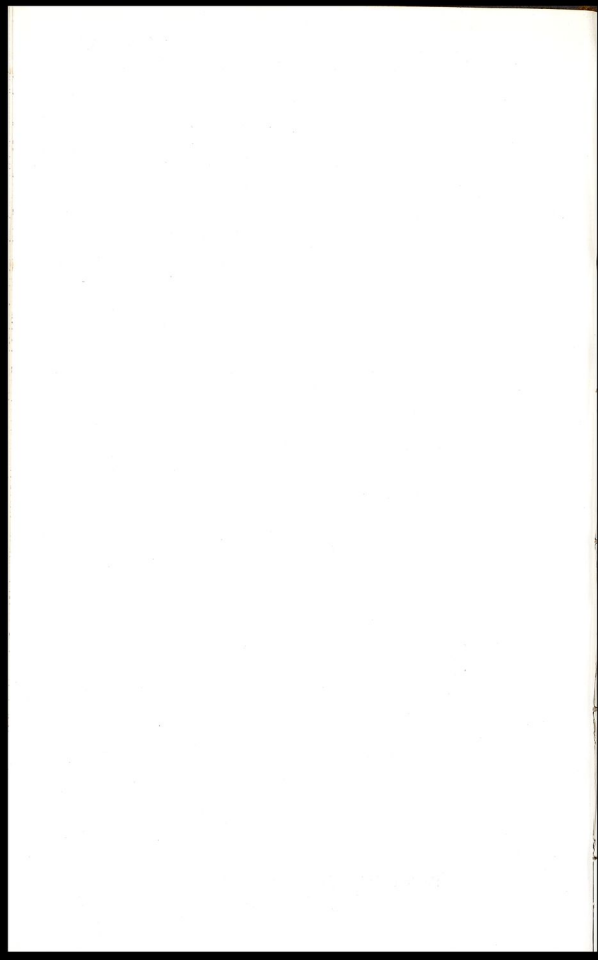


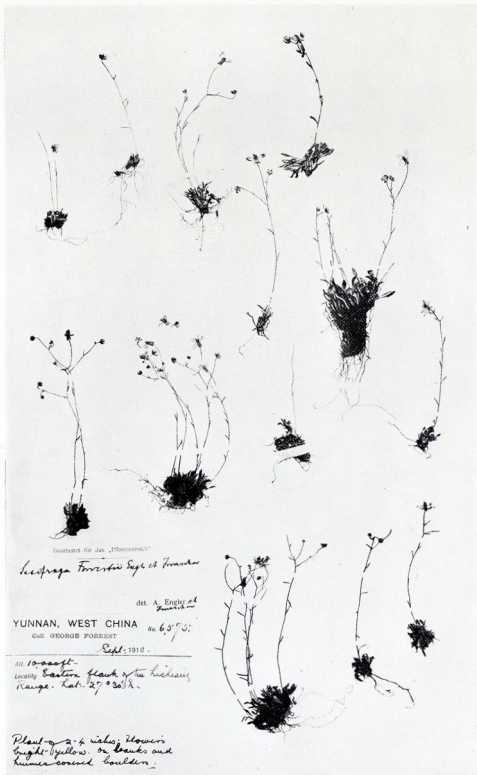


Saxifraga turfosa, Engl. et Frmscher.

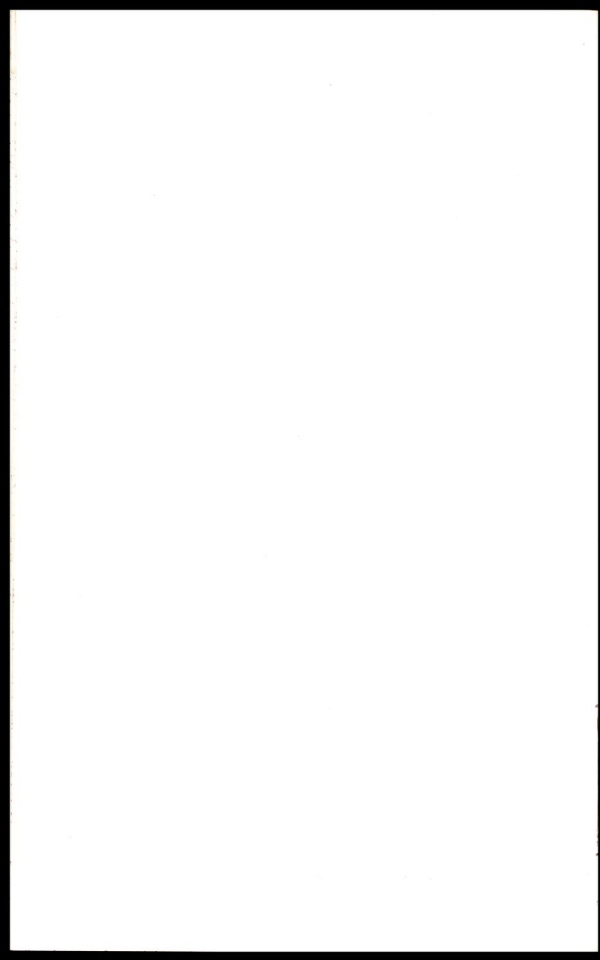


Saxifraga nigroglandulosa, Engl. et Frmscher





Saxifraga Forrestii, Engl. et Frmscher.





PLANTS OF S. TIBET AND S.W. CHINA.
COLLECTED BY GEORGE FURBER.
PRESENTED BY A. K. DUNCAN OF NEW, WESTON, GARDENERS.

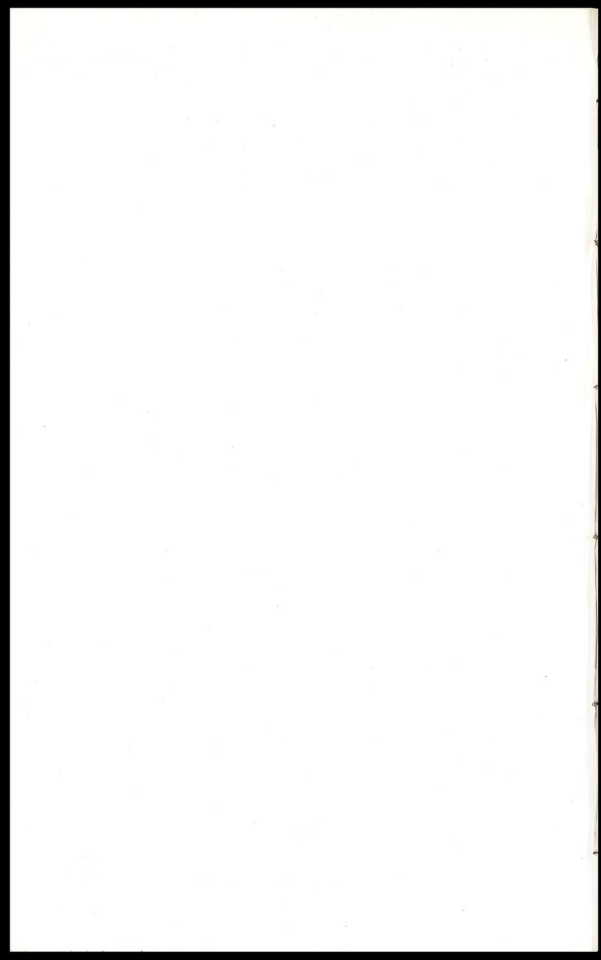
Bearbeitet für das "Pflanzenreich".
Saxifraga Balfourii Engl. et Frmsch.

det. A. Engler et Frmsch.

DEEP SOY. BUT. GARD. HON. 7.74
Saxifraga Rispidula D. Don.

On the descent from pass
between Kang Chuan &
Lung River valley
elevation 8000 ft. on steep
moist rocky situation.
Yunnan Sept. 21.
J. C.

Saxifraga Balfourii, Engl. et Frmsch.



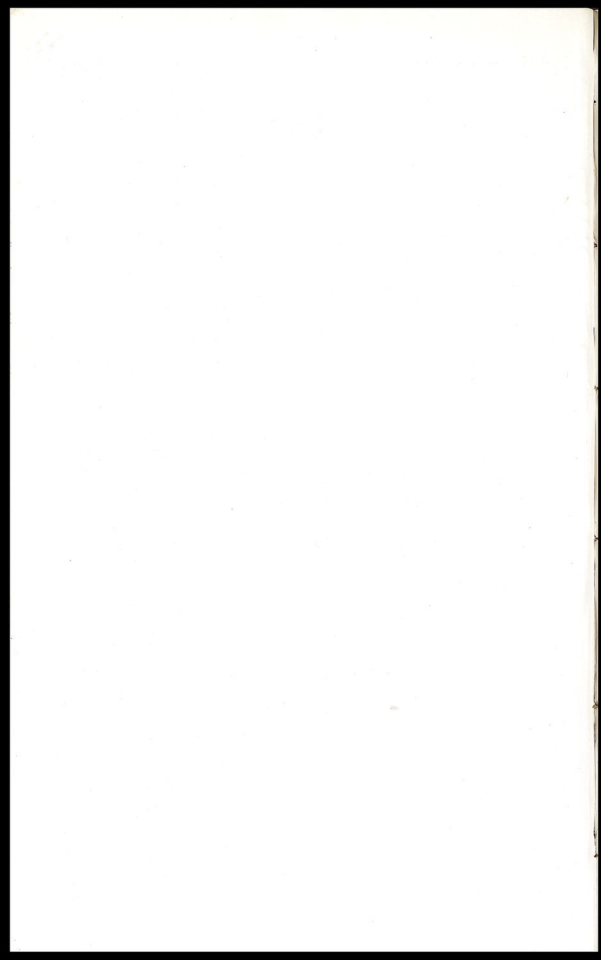


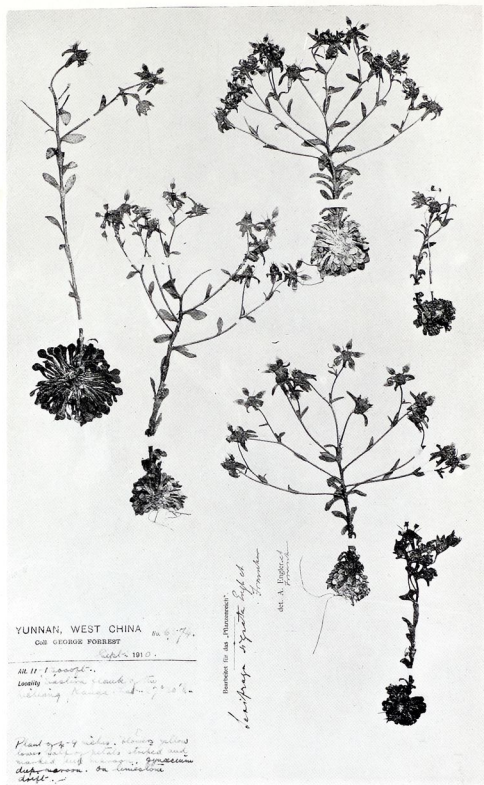
Saxifraga cinerascens Engl. et Frmscher.
 det. A. Engler

YUNNAN, WEST CHINA No. 6,628.
 COL. OSBORNE FORREST
 Sept. 1910.

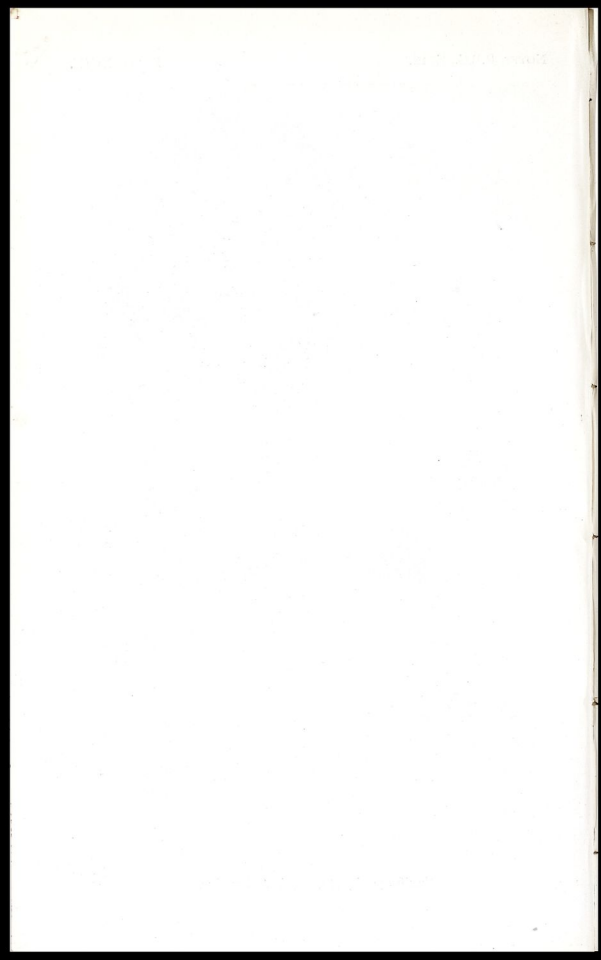
Alt. 12,000 ft.
 Locality: Eastern flank of the
 Heliang Range, lat. 27° 25' N.
Saxifraga cinerascens Engl. et Frmscher.
 forma major.
 Plant 4-6 inches. Flowers
 orange or reddish and bell-shaped.

Saxifraga cinerascens, Engl. et Frmscher.





Saxifraga signata, Engl. et Frmscher.





YUNNAN, WEST CHINA No. 6355
COL. GEORGE FOREST
Aug. 1910.

No. 12-13 Sept.
Locality: Eastern flank of the Liching
Range. Elev. 29,200 ft.

Bearbeitet für das „Pflanzenreich“.

Saxifraga sediformis Engl. et Frmscher

ae. *Saxifraga*

Upland plant 2-4 inches.
flowers golden yellow. on
cliffs and rocks.

Saxifraga sediformis, Engl. et Frmscher.

[Faint, illegible text covering the majority of the page, likely bleed-through from the reverse side.]



Saxifraga Brunoniana, Wall., var. *majuscula*, Engl. et Frmscher.



Saxifraga pulchra, Engl. et Frmscher.

